

REMARKS

We have addressed the Examiner's claim objections (paragraph 1 of the office action) and his § 112, second paragraph rejections in the amendments to the claims. We have also added claims 16-22.

Prior Art Rejections

Independent Claim 1

The Examiner rejected claims 1-4 as anticipated by Kim (U.S. 5,514,915).

We submit that Kim neither describes nor suggests a voltage recovery device including an inverter electrically coupled in shunt to a distribution line network and configured to transfer, in response to a fault condition detected on the utility power network, reactive power between the utility power network and voltage recovery device at a level and for a duration to recover the voltage on the distribution line network and voltage recovery device at a level and for a duration to recover the voltage on the utility power network to within a predetermined proportion of a nominal voltage, as recited in claim 1.

Kim describes a superconducting stabilizing system that includes an isolation switch for providing stored energy to loads and/or to a source of electrical power. Kim's isolation switch operates in one of two modes. In the first mode, :

[t]he isolation switch provides the means for isolating the load(s) from the utility system so that energy can be supplied only to the load(s) to continue operation or to enable the load(s) to "ride thru" the momentary voltage disturbance, thereby assisting the electrical power system in the recovery from the voltage sag or momentary outage by, in effect, shedding the load. (Col. 2, lines 33-39).

* * *

The isolation switch, in effect, sheds the load(s) from the line source during voltage sags or outages. Without the isolation switch, a superconducting energy storage device must not only support the load(s) but all devices connected to the power system

including those which are causing the disturbance. (Col. 3, lines 15-21).

Thus, in this first mode, Kim's system is effectively disconnected from the transmission system. That being the case, in this first mode, Kim's system clearly does not transfer, in response to a fault condition detected on the utility power network, reactive power between the distribution network and voltage recovery device at a level and for a duration to recover the voltage on the utility power network, much less within a predetermined proportion of the nominal voltage, as required by claim 1.

In the second mode, the isolation switch remains connected (effectively doing nothing) so that energy is supplied to the utility system indiscriminately (i.e., either to the load and/or the source). But, Kim says nothing about controlling his system such that, in response to a fault condition detected on the utility power network, reactive power is transferred between the distribution network and voltage recovery device at a level and for a duration to recover the voltage on the utility power network to within a predetermined proportion of the nominal voltage, as required by claim 1.

Applicants' invention, as recited in amended claim 1, is more than simply providing reactive power to the distribution line network as described by Kim. Rather, as discussed at page 5, line 8 to page 6, line 2 of applicants' specification, applicant was the first to recognize that the voltage on the transmission line network could be stabilized by injecting or absorbing reactive power at the distribution network. And, because the voltages on the distribution network are lower than those on the transmission network, the design and installation of a voltage recovery device for the distribution network is simpler and easier and reliability of the voltage recovery device is also higher.

We submit that because claims 2-4 depend from independent claim 1, these dependent claims are patentable over Kim for at least the same reason that claim 1 is patentable.

The Examiner also rejected dependent claim 5 as unpatentable over Kim in view of Amano (U.S. 5,703,791). Amano was cited as disclosing an interchangeable energy storage unit that could be selected from the group consisting of a flywheel, battery, capacitive unit, and

SMES. However, Amano does not disclose the features discussed above that were found to be missing in Kim. We submit, therefore that dependent claim 5 is patentable for at least the same reasons that independent claim 1 is patentable.

Independent Claim 6

The Examiner also rejected claims 6 and 7 as anticipated by Kim. We submit that Kim neither describes nor suggests a method of stabilizing a utility power network including operating, in response to detecting the fault condition, a first voltage recovery device to transfer reactive power to the utility power network at a level and for a duration to recover the voltage on the utility power network to within a predetermined proportion of the nominal voltage, as recited in amended claim 9. As discussed above, Kim describes a system that is operated in two modes. In the first mode, Kim's system simply disconnects the load on the distribution line network from the transmission line network. In the second mode, Kim supplies energy indiscriminately to the utility system, but says nothing about operating his system such that, in response to a fault condition detected on the utility power network, real and reactive power is transferred between the distribution network and voltage recovery device at a level and for a duration to recover the voltage on the utility power network to within a predetermined proportion of the nominal voltage, as required by claim 6.

We submit that because claim 7 depends from independent claim 6, this dependent claim is patentable over Kim for at least the same reasons that claim 6 is patentable.

The Examiner also rejected dependent claims 8-11 as unpatentable over Kim in view of Williams (U.S. 5,422,561). Williams was cited as disclosing the use of multiple voltage recovery devices to stabilize a utility power network. However, Williams does not disclose the features discussed above that were found to be missing in Kim. We submit, therefore that dependent claims 8-11 is patentable for at least the same reasons that independent claim 6 is patentable.

Independent Claim 12

The Examiner also rejected claim 12 as unpatentable over Kim in view of Williams (U.S. 5,422,561). The Examiner acknowledges that Kim does not disclose a controller implemented in a computer environment and having a processor and memory, but argues that Williams discloses such a controller. We submit however that neither Kim nor Williams disclose a memory including at least a portion for storing a computer program for controlling the voltage recovery device electrically coupled to the distribution network, the stored program including computer-readable instructions which, in response to an indication of a detected fault, provides control signals to a voltage recovery device to control the transfer of reactive power to the distribution network at a level and for a duration to recover the voltage on the transmission network to within a predetermined proportion of the nominal voltage, as recited in amended claim 12. As discussed above, in a first mode, Kim's system simply disconnects the load on the distribution line network from the transmission line network. While in a second mode, Kim supplies energy indiscriminately to the utility system.

Independent Claims 13 and 14

The Examiner also rejected independent claims 13 and 14 as unpatentable over Kim in view of Williams. The Examiner acknowledges that Kim does not disclose connecting a plurality of voltage recovery devices to the distribution network but argues that Williams discloses this feature. We submit however that neither Kim nor Williams disclose operating, in response to detecting the fault condition, one or more of the voltage recovery devices to transfer reactive power to the utility power network at a level and for a duration to recover the voltage on the utility power network to within a predetermined proportion of a nominal voltage, as recited in amended claim 13. Similarly, neither Kim nor Williams discloses voltage recovery devices connected to at least one of the distribution networks, each of the voltage recovery devices configured to provide reactive power to the at least one of the distribution networks at a level and for a duration to recover the voltage on the transmission network to within a predetermined proportion of the nominal voltage, following a fault condition detected on the utility power

Applicant : Paul Frederick Koeppe et al.
Serial No. : 09/449,435
Filed : November 24, 1999
Page : 11 of 11


Attorney's Docket No.: 05770-092001 / AMSC-440

network, as recited in amended claim 14. We further submit that because claim 15 depends from independent claim 14, this dependent claim is patentable over Kim in view of Williams for at least the same reason that claim 14 is patentable.

Enclosed is a check for \$36.00 for the required fee for two excess claims. Also enclosed is a Petition for Extension of Three Months of Time with the require fee of \$950.00. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: April 8, 2004



Frank R. Occhiuti
Reg. No. 35,306

Fish & Richardson P.C.
225 Franklin Street
Boston, MA 02110-2804
Telephone: (617) 542-5070
Facsimile: (617) 542-8906